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Thermal conductivity of epoxy resin composites filled with combustion synthesized AlN and h-BN powders

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Epoxy resin composites filled with combustion synthesized aluminum nitride (AlN) and hexagonal boron nitride (h-BN) powders were fabricated and their thermal conductivities were compared. The thermal conductivity of AlN-filled composites increases with increasing filler content but that h-BN filled composites increases with increasing filler content to a maximum then decrease with filler content further increased. There are considered to be caused by more randomly oriented h-BN particles at low filler contents but more horizontally at high filler contents. When comparing composites filled with AlN and h-BN particles with a similar size, the h-BN filled composites possess higher thermal conductivities than the AlN filled composites do in low filler content regions but the opposite was observed in high filler content regions.

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